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ABSTRACT

This study investigated two methods for teaching creativity in the elementary school curriculum. The two hypotheses tested were: (1) that students' creative thinking skills could be increased by a dispersion of creativity experiences throughout the elementary curriculum; and (2) that students' creative thinking skills could be equally increased by concentrating the creativity experience in one particular area of instruction, in this case social studies. One hundred and twenty-four fifth and sixth grade students in six self-contained classrooms with six different teachers were involved in the study. Two experimental groups (E1 classes) had their instruction in creative thinking concentrated in their social studies program and in an investigation of the history and ethnic bases of their home community. Another two experimental groups (E2 classes) were given instruction in creative thinking in the areas of art, science, creative writing, and use of a second language. Two control groups also participated in the study. Both the E1 and E2 groups used a creative problem-solving program as found in the "Creative Action Book" by Sydney Parnes. Pre- and posttests and a retention test were given to all groups. Results show that creative abilities were increased in students by either dispersing creativity training throughout the curriculum or by concentrating it in the social studies area, with no clear evidence favoring either group. The study also showed that the home community of students could be used as a data bank to teach social studies concepts and skills and that senior citizens could be effective as instructors. (RM)

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IMPLEMENTATION OF CREATIVITY TRAINING IN THE ELEMENTARY SCHOOL CURRICULUM THROUGH TWO VARIED TECHNIQUES

1981

by

Claudia Clague-Tweet, Ed.D.

SP 014 210

Introduction

In order to test two procedures for the implementation of creativity techniques in the elementary curriculum, a experimental teaching situation was established at the McKinley School in Butte, Montana, during the 1978-79 school year. The experiment involved one hundred and twenty-four students in six self-contained classrooms with six different teachers. Classes were at the fifth and sixth grades.

The two concepts tested were: 1. That students' creative thinking skills could be increased by a dispersion of creativity experiences throughout the elementary curriculum as proposed by Paul Torrance, and 2. That students' creative thinking skills could be equally as well increased, by concentrating the creativity experience in one particular area of instruction as advocated by James Smith. The area chosen for the concentrated instruction was social studies. Social studies was chosen because of Butte's strong ethnic factors and its unique development as a mining center and as the focal point of many labor and political issues which have carried over to the national and state levels.

Establishment of Comparable Groups

In order to establish that the six classrooms were comparable, the Torrance Test of Creative Thinking (TTCT) and the Test of Inquiry in Social Studies (TISS) were administered to all students before the beginning of instruction. It was determined that the classes were comparable and each class was assigned a role as either an E_1, E_2 or E_3 class. E_1, E_2 and E_3 groups were established at both the fifth and sixth grade level.

Assignments of roles were made on the basis of teacher preference and their understanding of the instructional strategies to be used with each particular class.

Testing Procedures

The complete testing program involved three testing situations: 1. A Pre-test to determine comparability of groups and to establish a base from which later test mean could be compared; 2. A Post-test to determine changes in mean and Gain Scores; 3. A Retention test to be used in an ANOVA and to also determine students' retention levels. The tests used were the TTCT and the TISS. Tests were administered in late September, before the initiation of instruction, in March after the completion of instruction, and in early June to establish retention scores. Testing was conducted, and tests scored by a certified counselor and the data were analyzed by using individualized computer cards for each student. The cards were assigned by an identification number and scores were listed by computerized notation. All summary data were analyzed and class means computed on the Sigma 7 computer at Montana State University under the direction of Dr. Lawrence Ellerbuch, Ph.D. The students' "t" test was employed to analyze the comparison of Pre-test to Post-test means and Change scores means. The ANOVA was used to determine if there was any interaction between students' sex and instructional method and between students' intelligence level and a particular instructional method. The .01 level was chosen as the signif-cant level.

Testing Instruments

One testing instrument used was the Torrance Test of Creative Thinking (TTCT) which provided sub-test means for each class in the creative areas of Fluency, Flexibility, Originality and Elaboration. The form used was the Figural B. This test was used to isolate specific areas of students' creative thinking for comparison purposes. The other test employed was the Test of Inquiry in Social Studies (TISS). This instrument tests for inquiry or creative thinking skills in the social studies. It was developed by Dr. Sharon Miur of the University of Nebraska at Omaha. The test follows Bloom's taxonomy of higher level thinking skills.

Instructional Strategies

The instruction strategies used with the various classes were organized around three procedures. The Experimental$_1$ (E_1) classes had their instruction in creative thinking concentrated in their social studies program and in an investigation of the history and ethnic bases of their home community. The Experimental$_2$ (E_2) classes were given instruction in creative thinking in various curricular areas such as Art, Science, Creative Writing, and use of a second language. Both E_1 and E_2 groups used a creative problem solving program as found in the Creative Action Book by Sydney Parnes. The Experimental E_3 classes served as non-instructional groups. The E_3 classes were utilized to determine if there were significant changes in scores on the TTCT or the TISS after instruction in creative thinking and creative problem solving.

Creativity Instruction

The instruction of both the E_1 and E_2 groups was directed to improving creative thinking and creative problem solving. Two different methods were employed but both strategies aim at increasing students' abilities to think creatively and to solve problems by creative approaches.

The methodology of Smith (Smith 1967) emphasizes ten instructional goals that are related to individualized creative development. This Smith program was the mode of instruction used as guidelines with the E_1 groups.

Paul E. Torrance has classified creative thought as being composed of fluency, flexibility, originality and elaboration. These basic qualities were the ones emphasized in the instruction of the E_2 groups. The E_2 program provided for a diversification of the Torrance basic components of creative thinking in various curricular areas.

The following comparison was developed to show the basic continuity between the Smith method as utilized with the E_1 group and the Torrance emphasis as presented in the E_1 instructional procedures.

Principles of the General Creativity Process. For the purposes of clarification, the characteristics of the creativity as described by Smith (1967) were classified into the categories of expressions of creativity as given by Torrance (1962).

The classification is given as:

Torrance	Smith
	1. Something new and different results.
1. Originality_____	2. Divergent thinking takes place.
	3. The outcomes of inquiries are unpredictable.
	4. The learner sets his/her own goals.
	5. Self-initiated learning is stimulated.
2. Fluency_____	6. Self-criticism is constructively developed.
	7. Many new ideas are developed.
	8. Open-ended situations are utilized.
3. Flexibility_____	9. Students explore ideas on their own.
	10. The process is as important as the product.
4. Elaboration_____	11. Ideas are explored.
	12. Motivational tensions provide for elaboration of thought.
	13. Pre-conscious thinking takes place.
	14. New thinking skills are developed.
	15. Creative explorations appear.
	16. Ideas are explored to provide an orientation to success.

Some instructional procedures utilized in this study were taken from the work of Smith (1967) and Parnes (1967). These techniques include:

1. Group and individual creative development.
2. Use of the textbook as a resource material.
3. Class discussions.
4. Brainstorming sessions.
5. Use of deferred evaluations and judgment.
6. Encouragement of original and flexible ideas.
7. Encouragement of a profusion of ideas on a central theme.
8. Encouragement of elaboration of ideas.
9. Making unusual ideas useful.
10. Explorations of the community as a data bank for social studies information.

Instruction Procedures Employed in Social Studies (E_1)

The E_1 classes began their program for the development of creative thinking and creative problem solving by being presented with the question, "How can we learn more about our home community." The classes worked through the Parnes creative problem-solving techniques and arrived at the solution that one of the better ways to learn about the community was to learn about the mining operations which form the economic basis for the city. Both fifth and sixth grade classes were involved in this problem finding exercise. Other instructional procedures were those proposed by James Smith (Smith 1966).

Students brainstormed investigation procedures and planned a field trip to the Berkeley Pit, the local mining operation and the Mining Museum.

Students planned to invite representatives of the Anaconda Company, the local mining operation, into their classrooms for explanations of mining programs and how such programs are effecting the growth and economy of the city. Students were told of the geography and geology of the Berkeley operation and of the cost factors. Representatives of Anaconda supplied maps of the areas which students studied to better understand the effect of mining on their home city.

Later the students undertook a study of how various ethnic groups became involved in the population of Butte and how ethnic peoples were employed in the mining industry. The national groups investigated were: Irish, Welsh, Scandinavian, Scotch-Irish, Serbian, Italian, Czech, and Chinese. The same creative-problem solving program was used in this later study. Students again invited representatives of the various ethnic groups to their classrooms and made visits to various homes to interview ethnic peoples and begin an oral history project for the school.

In the final step in the program, the E_1 groups visited the county courthouse and interviewed various office holders and representatives of local unions. Students studied not only the structure of the county government and political organization, but also the architecture of the historical courthouse.

In all their investigations, students used tape-recorders and cameras to record and preserve information. The pictures taken were later incorporated in a slide presentation on the history of the community. The presentation is currently housed at the McKinley school and has been circulated to other schools in the district for their use. Students established and managed a class media center to contain visual and library materials they had collected.

Instruction Procedures Employed with the Experimental$_2$ (E_2) Classes

Experimental$_2$ classes also were established in both the fifth and sixth grades. The E_1 groups instruction emphasized the Torrance components of creative thought. Students were presented with the question of: How they could improve their communication skills. Both fifth and sixth grade classes researched the idea of creative writing and using the creative problem-solving methods of Sydney Parnes determined that they would like to invite local newspaper personnel to their classes to assist them in composition. Instruction in writing skills was provided by a local reporter and the classes were invited to the Montana Standard for an instructional tour. Students developed creative writing centers and developed creative stories which were displayed at their school and in the local community. The skill of fluency was emphasized.

The E_2 students considered art as a form of communication and brain stormed the concept of art and artists. The classes invited local artists to their classes and participated in a program of line drawing conducted by the visiting artists. Their art work was also displayed in various settings and praised for its originality and elaborative details.

Another communication skill of interest to the E_2 students was the use of a second language. By employing the same problem-solving procedure and brainstorming, the students developed an instructional module for the learning of Spanish and invited a Spanish-speaking instructor into their classes. Through instruction many of the students developed a small

conversational use and understanding of the Spanish language. Students were directed to use Spanish as a flexibility tool for communication.

In connection with the students' interest in art and the Spanish language, they made visits to local art galleries and to a local Spanish festival.

As with the E_1 group, the E_2 students also used cameras and tape-recorders to preserve information. These students developed a picture collection of their art work and tapes of their conversations in Spanish. Both of these materials are currently being used at the McKinley and various district schools for instructional purposes.

The Torrance methods (Torrance 1967) were employed in the instructional program of the E_2 groups.

Instruction Procedures Employed with the Experimental$_3$ (E_3) Group

The Experimental$_3$ group was not exposed directly to any of the procedures employed with either the E_1 or E_2 classes. These classes, at both the fifth and sixth grades, followed in regular program of instruction provided by the teachers and found in the local curriculum guide.

Testing Results

After the instructional period, from October until March, all students (one hundred twenty-four) were again tested with the TTCT and the TISS by the same counselor. Class means were developed and compared to the mean scores on the Pre-test.

Post Test Results

In the comparisons of the fifth grade scores it was determined that there had been a significant change in means by the E_1 fifth grade group on the TISS for social studies. The fifth grade E_2 group improved their scores in the TTCT areas of fluency and originality.

The sixth grade groups also showed significant changes in scores. The E_1 group increased their scores significantly on the TISS for social studies and also in the TCTT areas of Fluency and Originality. The E_2 group also showed a significant changes on the TTCT on the subtests of Fluency and Originality. (See following Table II).

The E_3 non-instructional group's scores did not vary to a significant degree (See following Table I).

Change Scores. In considering the change from pre to post test class means, the following comparisons were made. The means of the E_1 groups were compared to the means of the E_3 group, the means of the E_2 groups were compared to the means of the E_3 groups and the means of the E_1 groups were compared to the means of the E_3 groups.

At the fifth grade level there was a significant difference in change score means between the E_1 and E_2 groups in favor of the E_2 group on the sub-test of fluency and originality. In comparing the E_2 group to the E_3 group at the fifth grade the E_2 group's mean was significantly above the E_3 mean in originality. The comparison of the E_1 group to the E_3 group displayed a difference in means on the TISS in favor of the E_1 group. (See Table III).

The Change scores in the sixth grade did not indicate a statistical difference between E_1 and E_2 groups on the TISS. There was a significant

difference between E_2 and E_3 groups on the sub-test of originality. In comparing the E_1 and E_3 groups the significant difference was on the TISS and on the TTCT sub-test of originality. (See Table IV).

Retention Test Data

The retention testing indicated that there had not been a significant change in previous test means. It appears that the social studies skills and the creative thinking skills developed by both the E_1 and E_2 groups at the fifth and sixth grades remained constant through the two-month retention period. (See graph on page 16).

ANOVA Analysis

By comparing the variables of students' sex and instructional procedures and students' intelligence level and instructional methods, it was hoped that some information could be obtained as to what teaching procedures was most effective with various students.

There was no interaction between students' sex and instructional method. Some main treatment effect was located between instructional methods employed in social studies with the E_1 students and intelligence levels. Students classified as highly intelligent and those classified as low on the intelligence scales seemed to produce higher scores on the TISS. (See graphs on pages 17 and 18).

This result would justify the use of creative teaching techniques and creative problem-solving with highly intelligent students and students who may have difficulty grasping social studies concepts and facts.

TABLE I. Pre-test to Post-test Comparisons of Fifth Grade Scores

		Social Studies		Creativity					
		TISS		Flue.		Flex.		Org.		Elab.	
		pre	pst	pre	pst	pre	pst	pre	pst	pre	pst
E_1 N=21	$\bar{X}$	18.4	22.4	20.9	20.7	16.57	19.23	2.60	26.7	62.9	64.91
	S.D.	4.72	5.55	6.68	5.12	5.41	7.10	8.47	11.90	18.80	16.28
mean dif.		3.76		.48		2.80		.48		2.14	
d.f.=19	S.D.	3.52		3.84		7.27		9.17		14.06	
	t	4.90		.57		1.77		.24		.37	
	p	.000*		.96		.09		.82		.71	
E_2 N=22	$\bar{X}$	18.4	20.35	18.5	22.31	15.86	22.09	23.8	40.27	70.04	74.10
	S.D.	4.68	4.30	5.66	5.05	3.86	5.78	6.30	14.86	19.92	14.10
mean dif.		2.60		3.18		6.36		16.64		5.14	
d.f.=20	S.D.	4.51		5.57		9.05		16.44		20.67	
	t	2.59		2.67		2.16		4.74		1.16	
	p	.09		.01*		.06		.000*		.25	
E_3 N=20	$\bar{X}$	18.5	19.23	20.5	21.86	18.72	21.28	30.5	34.28	62.95	62.47
	S.D.	3.70	3.72	7.35	5.38	5.93	5.29	10.84	10.79	20.64	20.75
mean dif.		.428		1.82		2.28		3.23		.14	
d.f.=19	S.D.	4.04		5.16		6.39		11.18		10.16	
	t	.49		1.33		1.64		1.32		.64	
	p	.63		.30		.12		.20		.95	

TABLE II. Pre-test to Post-test Comparisons of Sixth Grade Groups

		Social Studies		Creativity					
		TISS		Flue.		Flex.		Org.		Elab.	
		pre	pst	pre	pst	pre	pst	pre	pst	pre	pst
E_1 N=20	$\bar{X}$	21.57	26.8	17.5	22.1	15.04	19.85	23.4	37.5	57.7	61.90
	S.D.	6.18	5.25	4.92	5.93	4.94	5.94	8.45	10.04	24.54	19.90
	mean dif.	5.15		4.50		4.75		14.3		4.10	
d.f.=19	S.D.	3.73		6.04		9.20		12.96		24.18	
	t	6.17		3.33		2.02		4.93		.75	
	p	.000*		.004*		.07		.000*		.46	
E_2 N=20	$\bar{X}$	20.89	24.8	18.6	25.42	18.20	22.47	21.9	41.16	63.5	67.21
	S.D.	5.28	6.22	6.68	8.45	6.01	5.83	6.58	8.32	22.14	15.76
	mean dif.	3.90		7.00		3.95		18.89		3.26	
d.f.=18	S.D.	5.3		12.15		9.20		10.26		27.56	
	t	2.89		2.50		1.87		8.03		.52	
	p	.04		.02*		.08		.000*		.61	
E_3 N=21	$\bar{X}$	21.57	21.64	16.5	18.30	17.85	19.44	28.4	30.35	52.35	54.65
	S.D.	7.39	4.68	4.04	5.78	5.47	6.61	9.45	9.65	15.1	12.13
	mean dif.	1.10		1.55		1.39		2.05		3.75	
d.f.=19	S.D.	6.18		6.56		7.73		11.42		17.22	
	t	.79		1.05		.81		.83		.97	
	p	.44		.30		.43		.43		.34	

TABLE III. Fifth Grade Class Comparison of Change Scores (Pre-test to Retention by t-Values)

	Social Studies		Creativity							
	TISS		Flue.		Flex.		Orig.		Elab.	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
E_1	3.76	3.52	.48	3.84	2.80	7.27	.47	9.18	1.14	14.05
E_2	2.50	4.51	3.18	5.57	6.36	7.04	16.64	16.44	5.13	20.57
	t = 1.10		2.13		1.63		3.95		2.16	
d.f.=39	p = .27		.04*		.11		.000*		.09	
E_2	2.50	4.51	3.18	5.57	6.36	7.04	16.64	16.44	5.13	20.67
E_3	.41	3.94	3.59	5.10	2.18	6.26	3.09	10.93	.14	9.91
	t = 1.64		.25		2.03		2.26		4.35	
d.f.=39	p = .11		.82		.06		.003*		.001	
E_1	3.76	3.52	.48	3.84	2.80	7.27	.47	9.18	1.14	14.05
E_3	.41	3.94	3.59	5.10	2.18	6.26	3.09	10.93	.14	9.91
	t = 2.93		2.06		.30		.85		.27	
d.f.=41	p = .005*		.06		.76		.40		.79	

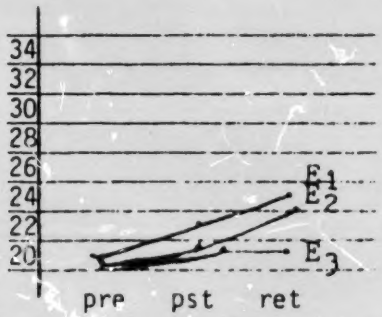
TABLE I. Sixth Grade Class Comparisons of Change Scores (pre to Post) by t-Values

	Social Studies		Creativity							
	TISS		Flue.		Flex.		Org.		Elab.	
	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.	$\bar{X}$	S.D.
E_1	5.15	3.73	4.50	6.04	4.75	7.02	14.3	12.95	4.1	24.18
E_2	3.89	6.03	5.55	13.49	3.14	9.63	17.15	12.67	.20	30.12
	t .78		.32		.59		.70		.45	
	p .44		.75		.55		.49		.65	
d.f. 37										
E_2	3.89	6.03	5.55	13.49	3.14	9.63	17.15	12.67	.20	30.12
E_3	1.10	6.18	1.55	6.56	1.39	7.73	2.05	11.41	3.75	17.22
	t 1.45		1.19		.63		3.96		.46	
	p 15		.24		.53		.000*		.65	
d.f. 37										
E_1	5.15	3.73	4.50	6.04	4.75	7.02	14.3	12.95	4.1	24.18
E_3	1.10	6.18	1.55	6.56	1.39	7.73	2.05	11.41	3.75	17.22
	t 2.51		1.47		1.43		3.17		.53	
	p .02*		.15		.16		.003*		.96	
d.f. 38										

Graphic Comparisons of Pre to Post to Retention Means for Each Class

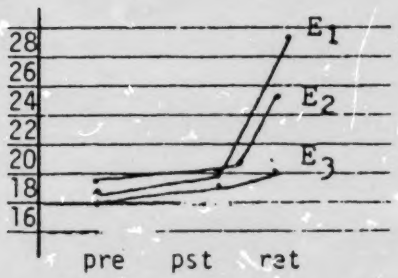
Fifth Grade

TISS

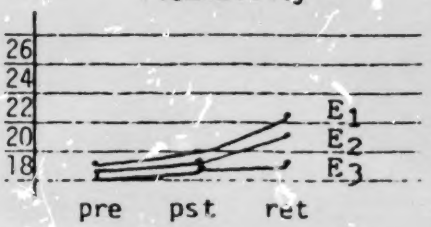


CREATIVITY VARIABLES

Fluency



Flexibility



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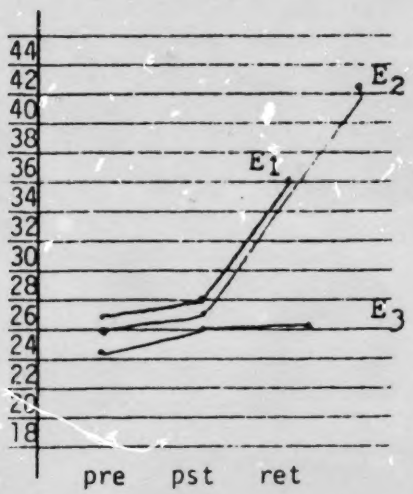

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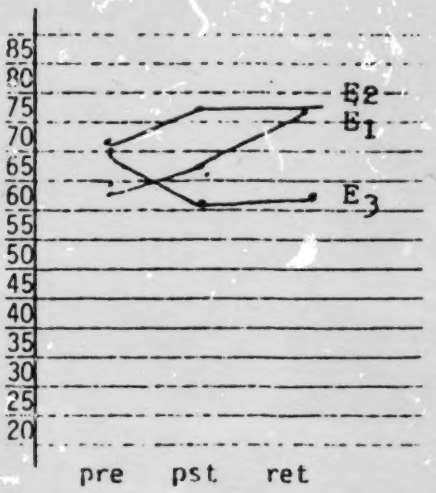
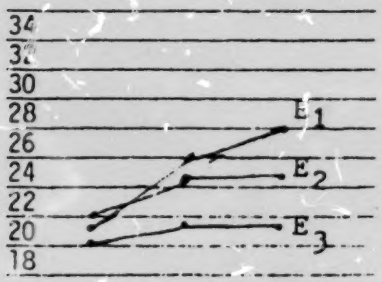


Graphic Comparisons of Pre to Post to
Retention Means for Each Class

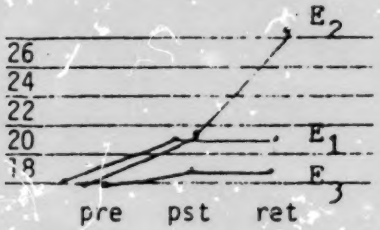
Sixth Grade

TISS



CREATIVITY VARIABLES

Fluency



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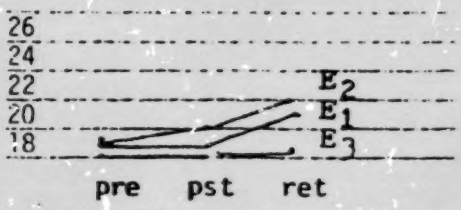
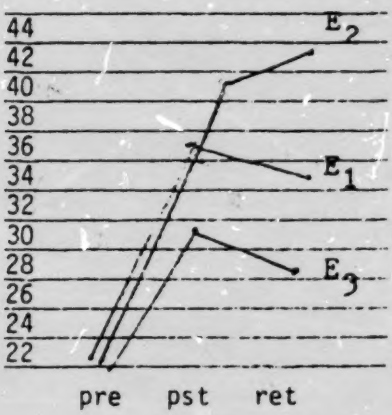
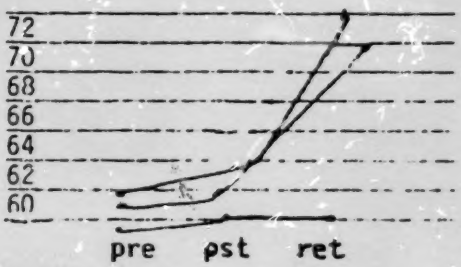


Originality



Elaboration



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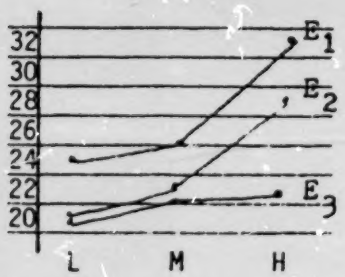
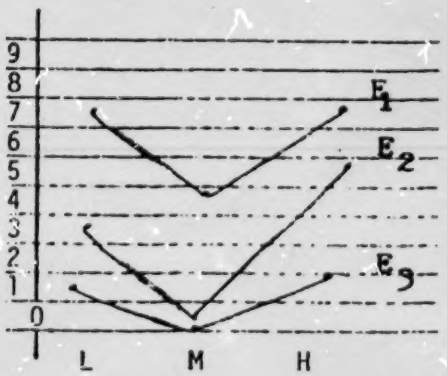
Graphic Comparisons of Intelligence Groups
Related to TISS Scores

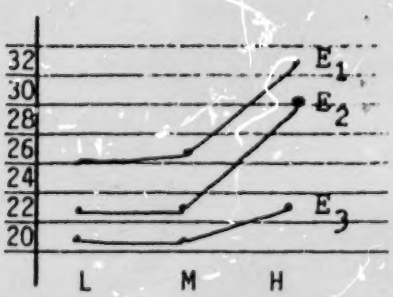
Post-test



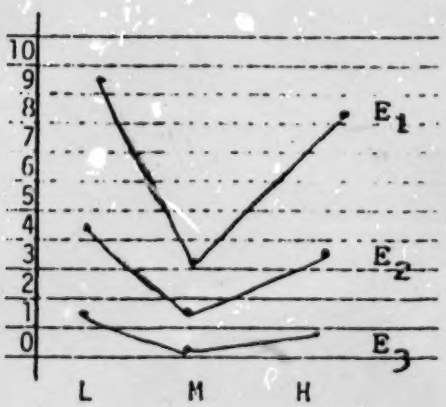
Change Scores (Pre to Post-tests)



Retention Scores



Net Change Scores



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CONCLUSIONS

The educational conclusions derived from this study consider both the areas of social studies and creativity, by noting implications specific to each particular area.

Social Studies Implications

1. Creativity training in the social studies curriculum could be used to improve both creative thinking skills in social studies and general creative abilities. The information obtained from this study seems to justify the use of creativity training in the social studies area.

2. Senior citizens could be used in various instructional roles in the social studies. With the E_1 groups in this study, some of the instruction in the ethnic and cultural base of the community was provided by senior citizens. Such persons could be invited to the classroom to explain cultural difference and topics which the senior citizens were experts on. This procedure could provide students with information not available to them through traditional teaching procedures and provide the senior citizens with means of establishing a positive relationship with todays schools and students.

3. The home community of the students could be used as a data bank for information related to social studies concepts, learning, and skills. The use of community information and data could make the acquisition of social studies skills more meaningful to students.

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4. The use of community personnel experts in particular fields could provide instruction in mini-courses to students. Such mini-courses could concentrate on various social studies learnings and skills.

Creativity Implications

1. Social studies could be used as a base for creativity instruction. Such instruction could be aimed at the development of both social studies competencies and creativity skills.

2. Other areas of the elementary curriculum could be used for creativity instruction. Reading, language arts, art and dramatics could serve as a base for creative training.

3. Creative thinking and creative problem solving could be incorporated into the general elementary curriculum. This incorporation could be in a specific area or dispersed throughout the general curriculum.

4. The use of creative problem solving could be incorporated in each grade level and progress through a series of levels as students developed their problem solving skills.

General Conclusions

1. Creative problem-solving and creative teaching techniques can increase the creative abilities of students. The use of such techniques increased students' creative abilities that were measured by the TCCT on the sub-tests for fluency, flexibility and originality.

2. The information gained from this study indicated that creative thinking in social studies was increased by use of creative procedures of Smith. The development of students' abilities to solve problems

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creatively was also increased by such instruction. It is recommended that creative problem-solving and creative teaching programs be incorporated into the social studies area. An investigation of the local community would be part of intermediate social studies programs to enlarge creative thinking abilities.

3. By using creative approaches to instruction and using the community as a data bank for information and research, it appeared that students' abilities to think creatively about their community was enhanced. This situation was apparently true with students who are highly intelligent or those who may experience some learning difficulties.

4. Creative abilities were increased in students by either dispersing creativity training throughcut the curriculum, as with Torrance methodology, or by concentrating it in the social studies area, as with Smith's procedures. The development of students' creative thinking in social studies was only increased by use of creative teaching methods and creative problem-solving in social studies classes.

SUMMARY

The experimental teaching procedures described in the preceding pages took place at the McKinley School in Butte, Montana, during the 1978-79 school year. The population of the experiment were fifth and sixth grade students. The time period extended from October until March.

Three experimental groups were selected at each grade level for a total of one hundred twenty-four students who were involved. Teaching procedures were conducted by regular classroom teachers under the direction of the researcher. The $Experimental_1$ group had creativity training incorporated into their social studies program. The $Experimental_2$ group had creativity training dispersed throughout the curriculum but not used in the social studies area. The $Experimental_3$ group acted as a non-treatment group, without emphasis on creativity or creative social studies instruction.

The testing program for the experiment was conducted by certified counselors of the school district. The testing conditions remained the same during all the testing situations.

The data obtained from the pre-testing, post-testing and retention testing was used to determine t values for the various groups in both the areas of creativity and social studies. Change score test data was also subjected to an Anova. The t-tests were conducted to determine if there had been a change in students' social studies or creativity skills during the course of the experiment. The Anova analysis was undertaken to detect possible interactions between students' intelligence or sex and the developed teaching procedures and curriculum.

Discussions of the results of the experiment were based on the objective data obtained from students' scores and subjective information obtained throughout the duration of the experiment. Educational implementations and conclusions based on the results of the experiment were presented for both the specific student population and general curriculum adaptations.

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